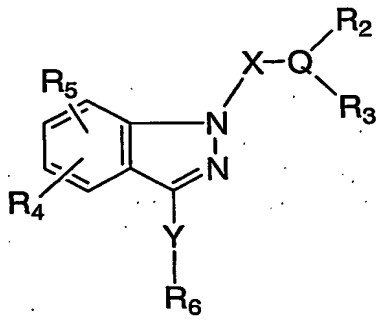
WHAT IS CLAIMED IS:

1. A compound of the structural formula I:



Formula I

or a pharmaceutically acceptable salt, enantiomer, diastereomer or mixture thereof:
wherein,
R represents hydrogen, or C_{1-6} alkyl;
X represents $-(CHR_7)_p-$, or $-(CHR_7)_pCO-$;
Y represents $-CO(CH_2)_n-$, CH_2, or $-CH(OR)-$;
Q represents N, or O, wherein R_2 is absent when Q is O;

R_w represents H, C_{1-6} alkyl, $-C(O)C_{1-6}$ alkyl, $-C(O)OC_{1-6}$ alkyl, $-SO_2N(R)_2$, $-SO_2C_{1-6}$ alkyl, $-SO_2C_{6-10}$ aryl, NO_2, CN or $-CON(R)_2$;

R_2 represents hydrogen, C_{1-10} alkyl, OH, C_{2-6} alkenyl, C_{1-6} alkylSR, $-(CH_2)_nO(CH_2)_mOR$, $-(CH_2)_nC_{1-6}$ alkoxy, $-(CH_2)_nC_{3-8}$ cycloalkyl, $-(CH_2)_nC_{3-10}$ heterocyclyl, $-N(R)_2$, $-COOR$, or $-(CH_2)_nC_{6-10}$ aryl, said alkyl, heterocyclyl, or aryl optionally substituted with 1-3 groups selected from R^a;

R_3 represents hydrogen, C_{1-10} alkyl, $-(CH_2)_nC_{3-8}$ cycloalkyl, $-(CH_2)_nC_{3-10}$ heterocyclyl, $-(CH_2)_nCOOR$, $-(CH_2)_nC_{6-10}$ aryl, $-(CH_2)_nNHR_8$, $-(CH_2)_nN(R)_2$, $-(CH_2)_nN(R_8)_2$, $-(CH_2)_nNHCOOR$, $-(CH_2)_nN(R_8)CO_2R$, $-(CH_2)_nN(R_8)COR$, $-(CH_2)_nNHCOR$, $-(CH_2)_nCONH(R_8)$, aryl, $-(CH_2)_nC_{1-6}$ alkoxy, CF_3, $-(CH_2)_nSO_2R$, $-(CH_2)_nSO_2N(R)_2$, $-(CH_2)_nCON(R)_2$, $-(CH_2)_nCONHC(R)_3$, $-(CH_2)_nCONHC(R)_2CO_2R$, $-(CH_2)_nCOR_8$, nitro, cyano or halogen, said alkyl, alkoxy, heterocyclyl, or aryl optionally substituted with 1-3 groups of R^a;

or, when Q is N, R_2 and R_3 taken together with the intervening N atom form a 4-10 membered heterocyclic carbon ring optionally interrupted by 1-2 atoms of O, S, C(O) or NR, and optionally having 1-4 double bonds, and optionally substituted by 1-3 groups selected from R^a;

R_4 and R_5 independently represent hydrogen, C_{1-6} alkoxy, OH, C_{1-6} alkyl, SO_qC_{1-6} alkyl, COC_{1-6} alkyl, COOR, SO_3H, $-O(CH_2)_nN(R)_2$, $-O(CH_2)_nCO_2R$, $-OPO(OH)_2$, CF_3, OCF_3, $-N(R)_2$, nitro, cyano, C_{1-6} alkylamino, or halogen; and

R_6 represents hydrogen, C_{1-10} alkyl, $-(CH_2)_nC_{6-10}$ aryl, NR_cR_d, $-NR(CH_2)_nC_{6-10}$ aryl, $-N((CH_2)_nC_{6-10}$ aryl$)_2$, $-(CH_2)_nC_{3-10}$ heterocyclyl, $-NR(CH_2)_nC_{3-10}$ heterocyclyl, $-N((CH_2)_nC_{3-10}$ heterocyclyl$)_2$, (C_{6-10} aryl)O-, $-(CH_2)_nC_{3-8}$ cycloalkyl, -COOR, $-C(O)CO_2R$, said aryl, heterocyclyl and alkyl optionally substituted with 1-3 groups selected from R^a, wherein the R^a(s) can be attached to any carbon atom or heteroatom selected from N and S;

R_c and R_d independently represent H, C1-6 alkyl, C_{2-6} alkenyl, C_{1-6} alkylSR, $-(CH_2)_nO(CH_2)_mOR$, $-(CH_2)_nC_{1-6}$ alkoxy, $-(CH_2)_nC_{3-8}$ cycloalkyl;

or R_c and R_d taken together with the intervening N atom form a 4-10 membered heterocyclic carbon ring optionally interrupted by 1-2 atoms of O, S, C(O) or NR, and optionally having 1-4 double bonds, and optionally substituted by 1-3 groups selected from R^a;

R_7 represents hydrogen, C_{1-6} alkyl, $-(CH_2)_nCOOR$ or $-(CH_2)_nN(R)_2$,

R_8 represents $-(CH_2)_nC_{3-8}$ cycloalkyl, $-(CH_2)_n$ 3-10 heterocyclyl, C_{1-6} alkoxy – or $(CH_2)_nC_{6-10}$ aryl said heterocyclyl, or aryl optionally substituted with 1-3 groups selected from R^a;

R^a represents F, Cl, Br, I, CF_3, $N(R)_2$, NO_2, CN, -O-, $-COR_8$, $-CONHR_8$, $-CON(R_8)2$, $-O(CH_2)_nCOOR$, $-NH(CH_2)_nOR$, -COOR, $-OCF_3$, CF_2CH_2OR, -NHCOR, $-SO_2R$, $-SO_2NR_2$, -SR, (C_1-C_6 alkyl)O-, $-(CH_2)_nO(CH_2)_mOR$, $-O(CH_2)_nO(CH_2)_mOR$, $-(CH_2)_nC_{1-6}$ alkoxy, (aryl)O-, $-(CH_2)_nOH$, (C_1-C_6 alkyl)$S(O)_m$-, H_2N-C(NH)-, (C_1-C_6 alkyl)C(O)-, (C_1-C_6 alkyl)OC(O)NH-, -(C_1-C_6 alkyl)$NR_w(CH_2)_nC_{3-10}$ heterocyclyl-R_w, -(C_1-C_6 alkyl)$O(CH_2)_nC_{3-10}$ heterocyclyl-R_w, -(C_1-C_6 alkyl)$S(CH_2)_nC_{3-10}$ heterocyclyl-R_w, -(C_1-C_6 alkyl)-C3-10 heterocyclyl-R_w, $-(CH_2)_n$-Z^1-$C(=Z^2)N(R)_2$, -(C_{2-6} alkenyl)$NR_w(CH_2)_nC_{3-10}$ heterocyclyl-R_w,

-(C_{2-6} alkenyl)O(CH_2)$_n$$C_{3-10}$ heterocyclyl-R_w, -(C_{2-6} alkenyl)S(CH_2)$_n$$C_{3-10}$ heterocyclyl-R_w, -(C_{2-6} alkenyl)-C_{3-10} heterocyclyl-R_w, -(C_{2-6} alkenyl)-Z^1-C(=Z^2)N(R)$_2$, -(CH_2)$_n$$SO_2$R, -($CH_2$)$_n$$SO_3$H, -($CH_2$)$_n$PO(OR)$_2$, C_{3-10}cycloalkyl, C_{6-10} aryl, C_{3-10} heterocyclyl, C_{2-6} alkenyl, and C_1-C_{10} alkyl, said alkyl, alkenyl, alkoxy, heterocyclyl and aryl optionally substituted with 1-3 groups selected from C_1-C_6 alkyl, halogen, CN, NO_2, -(CH_2)$_n$OH, CON(R)$_2$ and COOR;

Z^1 and Z^2 independently represents NR_w, O, CH_2, or S;

m is 0-3;

n is 0-3;

p is 0-3 and

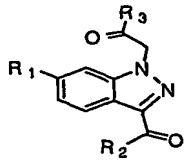
q is 0-2.

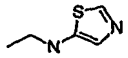
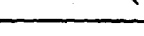
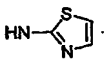
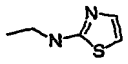
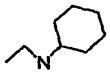
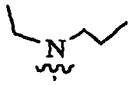
2. A compound according to claim 1 wherein R_6 is (CH_2)$_n$$C_{6-10}$ aryl, (CH_2)$_n$$C_{3-10}$ heterocyclyl, NR_cR_d or (CH_2)$_n$$C_{3-8}$ cycloalkyl, said aryl, heterocyclyl and alkyl optionally substituted with 1 to 3 groups of R^a.

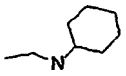
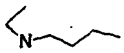
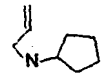
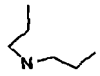
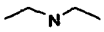
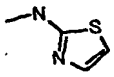
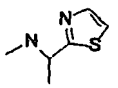
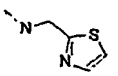
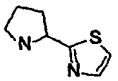
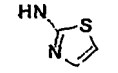
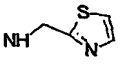
3. A compound according to claim 1 wherein Y is -CO(CH_2)$_n$, Q is N, R_2 is hydrogen, C_{1-10} alkyl or C_{1-6} alkylOH, R_3 is C_{1-10} alkyl or (CH_2)$_n$$C_{3-10}$ heterocyclyl, and X is –(CHR_7)$_p$CO-, and p is 1-3 said heterocyclyl optionally substituted with 1 to 3 groups of R^a.

4. A compound of Table 1 through 4 which is:

Table 1



R1	R2	R3
H	Phenyl	
H	Phenyl	
H	Phenyl	
H	Phenyl	
H	Phenyl	
H	Phenyl	
H	Phenyl	
OMe	Phenyl	

R1	R2	R3
OMe	Phenyl	
OMe	Phenyl	
OMe	Phenyl	
OMe	Phenyl	
OMe	Phenyl	
OMe	Phenyl	
OMe	Phenyl	
OMe	Phenyl	
OMe	Phenyl	
OMe	Phenyl	
OMe	Phenyl	

Tabel 1 Cont'd

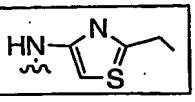
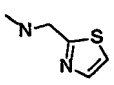
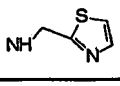
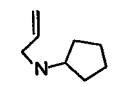
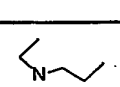
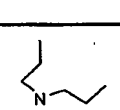
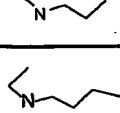
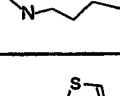
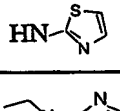
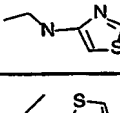
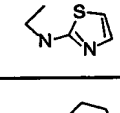
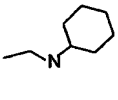
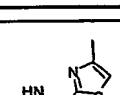
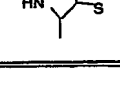
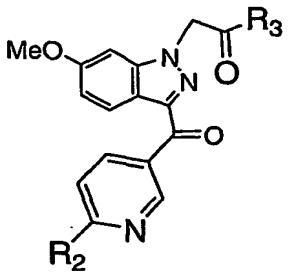
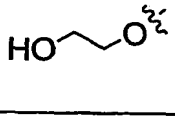
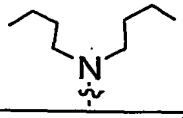
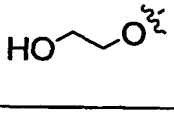
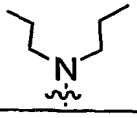
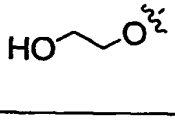
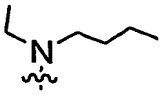
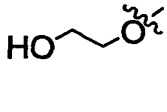
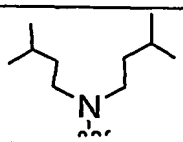
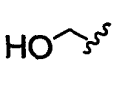
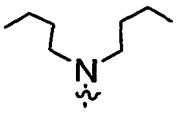
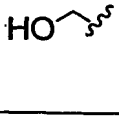
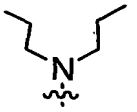
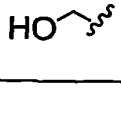
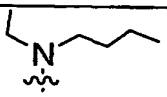
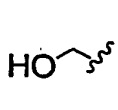
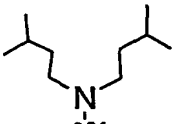
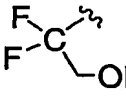
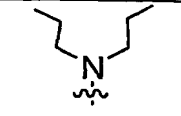
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Table 2



R2	R3
	
	
	
	
	
	
	
	
	

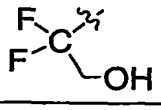
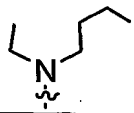
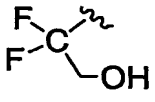
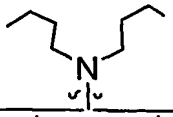
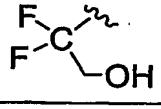
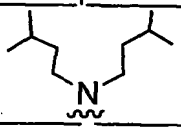
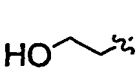
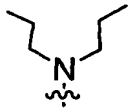
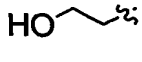
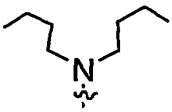
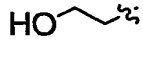
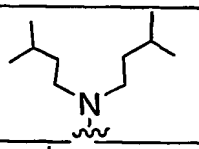
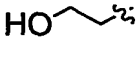
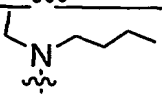
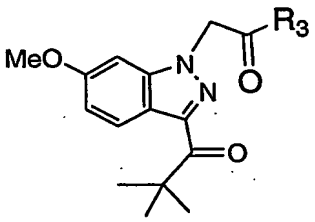
R2	R3
	
	
	
	
	
	
	

Table 3



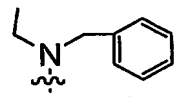
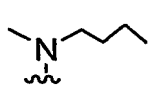
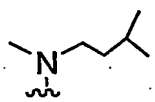
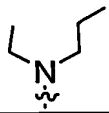
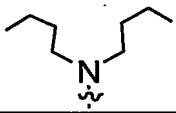
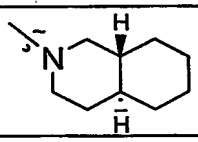
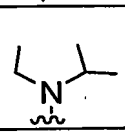
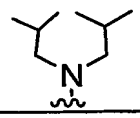
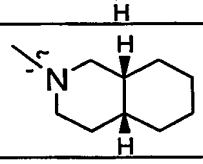
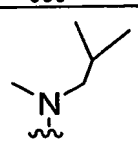
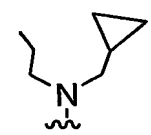
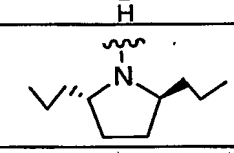
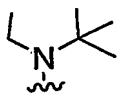
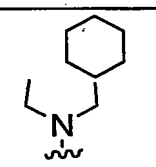
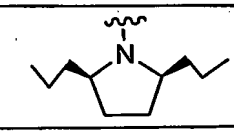
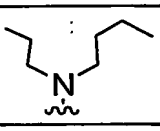
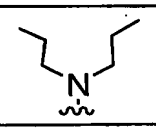
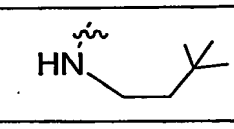
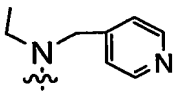
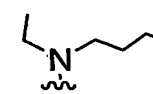
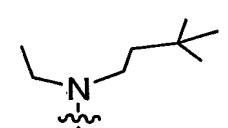
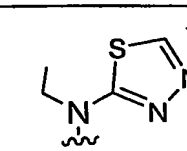
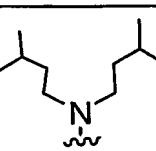
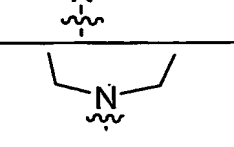
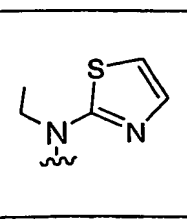
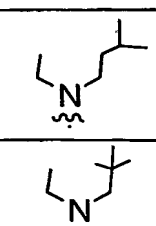
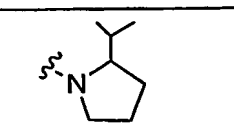
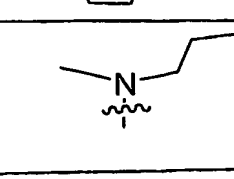
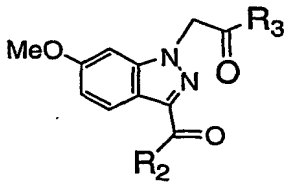
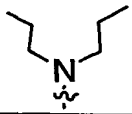
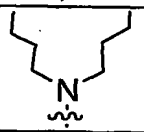
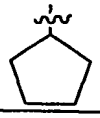
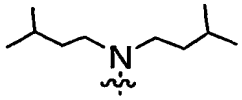
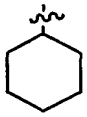
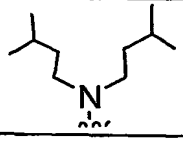
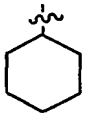
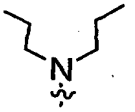
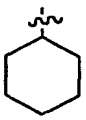
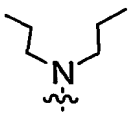
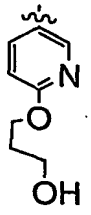
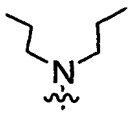
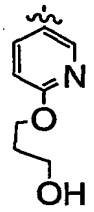
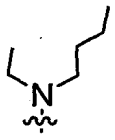
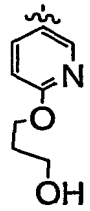
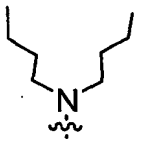
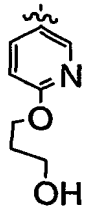
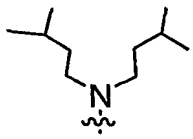
R3	R3	R3
		
		
		
		
		
		
		
		
		
		

Table 4



R2	R3
	
	
	
	
	
	
	

R2	R3
	
	
	

or a pharmaceutically acceptable salt, enantiomer, diastereomer or mixture thereof.

5. A method for treating ocular hypertension or glaucoma comprising administration to a patient in need of such treatment a therapeutically effective amount of a compound of claim 1.

6. A method for treating macular edema, macular degeneration, increasing retinal and optic nerve head blood velocity, increasing retinal and optic nerve oxygen tension, and/or a neuroprotective effect comprising administration to a patient in need of such treatment a pharmaceutically effective amount of a compound of claim 1; or a pharmaceutically acceptable salt, enantiomer, diastereomer or mixture thereof.

7. A method of preventing repolarization or hyperpolarization of a mammalian cell containing potassium channel or a method of treating Alzheimer's Disease, depression, cognitive disorders, and/or arrhythmia disorders in a patient in need thereof comprising administering a pharmaceutically effective amount of a compound according to Claim 1, or a pharmaceutically acceptable salt, enantiomer, diastereomer or mixture thereof.

8. A method of treating diabetes in a patient in need thereof comprising administering a pharmaceutically effective amount of a compound according to claim 1, or a pharmaceutically acceptable salt, enantiomer, diastereomer or mixture thereof.

9. A composition comprising a compound of formula I of claim 1 and a pharmaceutically acceptable carrier.

10. The composition according to Claim 9 wherein the compound of formula I is applied as a topical formulation, said topical formulation administered as a solution or suspension and optionally containing xanthan gum or gellan gum.

11. A composition according to claim 9 wherein an active ingredient belonging to the group consisting of: beta-adrenergic blocking agent, parasympatho-mimetic agent, sympathomimetic agent, carbonic anhydrase inhibitor, EP4 agonist, a prostaglandin or derivative thereof, hypotensive lipid, neuroprotectant, and/or 5-HT2 receptor agonist is optionally added.

12. A composition according to claim 11 wherein the beta-adrenergic blocking agent is timolol, betaxolol, levobetaxolol, carteolol, or levobunolol; the parasympathomimetic agent is pilocarpine; the sympathomimetic agent is epinephrine, brimonidine, iopidine, clonidine, or para-aminoclonidine, the carbonic anhydrase inhibitor is dorzolamide, acetazolamide, metazolamide or brinzolamide; the prostaglandin is latanoprost, travaprost, unoprostone, rescula, or S1033, the hypotensive lipid is lumigan, the neuroprotectant is eliprodil, R-eliprodil or memantine; and the 5-HT2 receptor agonist is 1-(2-aminopropyl)-3-methyl-1H-imdazol-6-ol fumarate or 2-(3-chloro-6-methoxy-indazol-1-yl)-1-methyl-ethylamine.